PATENT COOPERATION TREATY

● PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A30038 WO	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB 03/01204	International filing date *(day/month/year)* 21.03.2003	Priority date *(day/month/year)* 27.03.2002

International Patent Classification (IPC) or both national classification and IPC
H04N7/64

Applicant
BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

    ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

    These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

    I ☒ Basis of the opinion

    II ☐ Priority

    III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

    IV ☐ Lack of unity of invention

    V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

    VI ☐ Certain documents cited

    VII ☐ Certain defects in the international application

    VIII ☐ Certain observations on the international application

Date of submission of the demand 03.11.2003	Date of completion of this report 22.06.2004
Name and mailing address of the International preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Georgiou, G Telephone No. +31 70 340-2562

INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

International application No.   PCT/GB 03/01204

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

    Description, Pages

    1-11   as originally filed

    Claims, Numbers

    1-19   received on 03.05.2004 with letter of 29.04.2004

    Drawings, Sheets

    1/5-5/5   as originally filed

2. With regard to the **language,** all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

    These elements were available or furnished to this Authority in the following language: , which is:

    ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

    ☐ the language of publication of the international application (under Rule 48.3(b)).

    ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

    ☐ contained in the international application in written form.

    ☐ filed together with the international application in computer readable form.

    ☐ furnished subsequently to this Authority in written form.

    ☐ furnished subsequently to this Authority in computer readable form.

    ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

    ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

    ☐ the description,   pages:

    ☐ the claims,   Nos.:

    ☐ the drawings,   sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-19
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-19
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: EP-A-0 763 944 (OKI ELECTRIC IND CO LTD) 19 March 1997 (1997-03-19)

D2: WIEGAND T ET AL: "ERROR-RESILIENT VIDEO TRANSMISSION USING LONG-TERM MEMORY MOTION-COMPENSATED PREDICTION" IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, IEEE INC. NEW YORK, US, vol. 18, no. 6, June 2000 (2000-06), pages 1050-1062, XP000915348 ISSN: 0733-8716

D3: WO 02/054776 A (NOKIA CORP ;KURCEREN RAGIP (US); KARCZEWICZ MARTA (US)) 11 July 2002 (2002-07-11)

D4: KUREEREN R ET AL: "Synchronization-predictive coding for video compression: the sp frames design for jvt/h.26l" PROCEEDINGS 2002 INTERNATIONAL CONFERENCE ON IMAGE PROCESSING. ICIP 2002. ROCHESTER, NY, SEPT. 22 - 25, 2002, INTERNATIONAL CONFERENCE ON IMAGE PROCESSING, NEW YORK, NY: IEEE, US, vol. 2 OF 3, 22 September 2002 (2002-09-22), pages 497-500, XP010608017 ISBN: 0-7803-7622-6

1. **Claim 1**

1.1 **Novelty**

Any of the documents D1 or D2, which are considered to represent the most relevant state of the art, discloses:

a method of transmitting video data (see D1, Figure 1, see D2, Figure 3);

comprising the steps of

encoding a first sequence of video frames (see D1, Figure 1, 302, see D2, Figure 3);

encoding a second sequence of video frames predicted from a reference frame (see D1, column 14, lines 13-16, see D2, page 1059, right-hand column, "NACK

Mode... after error concealment");

transmitting data from said first sequence to a receiver (see D1, Figure 1, 307, see D2, Figure 3);

on receiving from the receiver an indication that one or more frames in said first sequence is corrupted, transmitting data from the second sequence to the receiver (see D1, column 13, lines 57 - column 14, line 8, see D2, page 1059, right hand-column, "NACK Mode... after error concealment")

from which the subject-matter of claim 1 differs in that

a)   the second sequence of video frames corresponds to said first sequence of video frames

and in that

b)   on receiving from the receiver an indication that one or more frames in said first sequence is corrupted, transmitting data corresponding to said one or more corrupted frames to the receiver from second sequence of frames

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

1.2   Inventive Step

Neither of documents D1 or D2 does teach or suggest the encoding of a second sequence of frames corresponding to the first sequence of frames, so that when an error occurs, the transmitter transmits frames from the second sequence and in particular transmits frames corresponding to the frames lost, so that the receiver continues decoding with the smallest possible delay. The rest of the prior art at hand does not teach or suggest this feature either.

Thus, the subject-matter of claim 1 involves an inventive step, Art 33(3) PCT.

2. Corresponding claim 12

The same arguments apply mutatis mutandis to the corresponding apparatus claim 12, the subject matter of which is new and inventive.

3. Claim 3

3.1 Novelty

Any of the documents D1 or D2, which are considered to represent the most relevant state of the art, discloses:

a method for compensating for transmission errors in a video data stream (see D1, column 13, line 45 - column 14, line 16, see D2, page 1050, right-hand column, lines 35 to 43);

comprising

transmitting a first video data stream from a transmitter to a receiver (see D1, column 6, line 16 - 24, Figure 1, see D2, page 1059, right-hand column, "NACK Mode... after error concealment");

detecting corrupted data in the transmitting data stream (see D1, column 12, line 42 - 50, see D2, page 1059, left-hand column, "In the following set of experiments... had to be concealed");

generating an indication that one ore more frames in said first sequence is/are corrupted (see D1, column 12, line 42 - 50, see D2, page 1059, left-hand column, second line from the bottom - right-hand, column, first line);

in response to said indication, transmitting data from a second video data stream predicted from a reference frame (see D1, column 13, line 45 - column 14, line 16, fig 11, see D2, page 1059, right-hand column, "NACK Mode... after error concealment");

from which the subject-matter of claim 1 differs in that

in response to the indication that data is corrupted, transmitting frames corresponding to said one or more corrupted frames from a second sequence of video frames, said second sequence corresponding to said first sequence.

The subject-matter of claim 3 is therefore new (Article 33(2) PCT).

3.2 Inventive Step

Neither of documents D1 or D2 does teach or suggest the encoding of a second sequence of frames corresponding to the first sequence of frames, so that when an error occurs, the transmitter transmits frames from the second sequence and in particular transmits frames corresponding to the frames lost, so that the receiver · continues decoding with the smallest possible delay. The rest of the prior art at hand does not teach or suggest this feature either.

Thus, the subject-matter of claim 3 involves an inventive step, Art 33(3) PCT.

4. Corresponding claim 14

The same arguments apply mutatis mutandis to the corresponding apparatus claim 14, the subject matter of which is new and inventive.

5. Dependent Claims

Dependent claims 2, 4-11, 13, and 15-19 further limit the independent claims 1, 3, 12, 14 and are therefore novel and inventive.

5. Certain Published Documents

Documents D3 and D4 are referred to by virtue of Rule 64.3 PCT (Rule 70.10 PCT). They are currently not relevant with respect to the opinion on patentability. Nevertheless, the applicant is informed that they might be relevant during the regional phase of the present application.

12   EPO - DG 1

CLAIMS   03. 05. 2004

1.   A method of transmitting video data, comprising the steps of:
        encoding a first sequence of video frames;

5   encoding a second sequence of video frames corresponding to said first
sequence of video frames, all video frames in said second sequence predicted
from a single reference frame;
        transmitting data from said first sequence to a receiver;
        on receiving from the receiver an indication that one or more frames in

10   said first sequence is corrupted, transmitting data corresponding to said one or
more corrupted frames to the receiver from said second sequence of frames.

2.   A method according to claim 1, further comprising:
        reverting back to transmitting data from said first sequence after data

15   from the second sequence has been transmitted to the receiver.

3.   A method of compensating for transmission errors in a video data signal
comprising:
        transmitting a first sequence of video frames from a transmitter to a

20   receiver,
        detecting one or more corrupted frames in said first sequence;
        generating an indication that one or more frames in said first sequence
is/are corrupted;
        in response to said indication, transmitting frames corresponding to said

25   one or more corrupted frames from a second sequence of video frames, said
second sequence corresponding to said first sequence, all video frames in said
second sequence predicted from a single reference frame.

AMENDED SHEET

13

4.   A method according to claim 3, further comprising reverting back to transmitting frames from said first sequence after frames have been transmitted to the receiver from the second sequence.

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5.   A method according to claim 3 or 4, wherein the step of detecting corrupted frames is carried out at the receiver.

6.   A method according to any of claims 3 to 5, wherein the step of

10   generating an indication that frames are corrupted is carried out at the receiver.

7.   A method according to any of claims 3 to 6, wherein the step of generating an indication that frames are corrupted includes the receiver generating an indication signal and transmitting the indication signal to the

15   transmitter.

8.   A method according to any of claims 3 to 7, wherein the step of transmitting frames from said second sequence is performed at the transmitter, the transmitted frames from said second sequence being received by the

20   receiver.

9.   A storage medium carrying computer readable code representing instructions for causing one or more processors to perform the method according to any of claims 1 to 8 when the instructions are executed by the

25   processor or processors.

14

10.   A computer program comprising instructions for causing one or more
processors to perform the method according to any of claims 1 to 8 when the
instructions are executed by the processor or processors.

5   11.   A computer data signal embodied in a carrier wave and representing
instructions for causing one or more processors to perform the method
according to any of claims 1 to 8 when the instructions are executed by the
processor or processors.

10   12.   Apparatus for transmitting video data, comprising:
        an encoder for encoding a first sequence of video frames, the encoder
further arranged for encoding a second sequence of video frames corresponding
to said first sequence, all video frames in said second sequence predicted from a
single reference frame;

15   a transmitter for transmitting frames from said first sequence to a
receiver;
        means for receiving from the receiver an indication that one or more
frames in said first sequence is/are corrupted;
        wherein said transmitter is arranged in operation to transmit frames

20   corresponding to said one or more corrupted frames from said second sequence
to said receiver, upon receiving said indication.

13.   Apparatus according to claim 12, the transmitter being further arranged
in operation to revert back to transmitting frames from said first sequence after

25   frames have been transmitted to the receiver from the second sequence.

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14.   A system for compensating for transmission errors in a video data signal comprising:

a transmitter for transmitting a first sequence of video frames;

a receiver for receiving said first sequence;

5   means for detecting one or more corrupted frames in said first sequence;

means for transmitting frames corresponding to said one or more corrupted frames from a second sequence of video frames, said second sequence corresponding to said first sequence, all video frames in said second sequence predicted from a single reference frame.

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15.   A system according to claim 14, wherein the means for detecting corrupted frames in said first sequence is at the receiver.

16.   A system according to claim 14 or 15, wherein the transmitter is 15   operable to transmit frames from said second sequence to the receiver after detection of one or more corrupted frames in said first sequence.

17.   A storage medium carrying computer readable code representing instructions for causing one or more processors to operate as the system 20   according to any of claims 12 to 16 when the instructions are executed by the processor or processors.

18.   A computer program comprising instructions for causing one or more processors to operate as the system according to any of claims 12 to 16 when 25   the instructions are executed by the processor or processors.

16

19.   A computer data signal embodied in a carrier wave and representing instructions for causing one or more processors to operate as the system according to any of claims 12 to 16 when the instructions are executed by the processor or processors.

5